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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Hopper et al.

Attorney Docket No.:
NSC1P282/P05730

Patent: 7,119,431 B1

Issued: October 10, 2006

Title: APPARATUS AND METHOD FOR FORMING HEAT SINKS ON SILICON ON INSULATED WAFERS

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on April 23, 2007 in an envelope addressed to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed: _____
Aurelia M. Sanchez

REQUEST FOR CERTIFICATE OF CORRECTION OF OFFICE MISTAKE (35 U.S.C. §254, 37 CFR §1.322)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Attn: Certificate of Correction

Dear Sir:

Attached is Form PTO-1050 (Certificate of Correction) at least one copy of which is suitable for printing. The errors together with the exact page and line number where the errors are shown correctly in the application file are as follows:

SPECIFICATION:

1. Column 1, line 42, change "stricture" to --structure--. This appears correctly in the patent application as filed on September 18, 2003 on page 2, paragraph 1, line 1.

2. Column 2, line 30, change "to fom" to --to form--. This appears correctly in the patent application as filed on September 18, 2003 on page 4, paragraph 5, line 1.

CLAIMS:

1. In line 1 of claim 9 (column 6, line 30) change "claim 7" to --to claim 8--. This appears correctly in Amendment E as filed on April 28, 2006 on page 3, paragraph 4, line 1, as claim 13 – originally dependent on claim 12, which was renumbered in the patent as claim 8.

Patentee hereby requests expedited issuance of the Certificate of Correction because the error lies with the Office and because the error is clearly disclosed in the records of the Office. As required for expedited issuance, enclosed is documentation that unequivocally supports the patentee's assertion without needing reference to the patent file wrapper.

It is noted that the above-identified errors were printing errors that apparently occurred during the printing process. Accordingly, it is believed that no fees are due in connection with the filing of this Request for Certificate of Correction. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. NSC1P282).

Respectfully submitted,
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complete isolation structure is encapsulated around and underneath the transistor. Electrically isolated transistors can be placed closer to one another than transistors without the isolation. Consequently, the circuit density can be increased.

[0005] Heat dissipation is a significant problem with SOI chips. Oxide is a relatively poor heat conductor. High speed and/or high powered transistors tend to generate a great deal of heat during operation. Since the aforementioned transistors act as a heat source and are surrounded by insulation, (the oxide layer) the temperature of the active layer can significantly increase. In severe situations, the switching characteristics of the transistors may be adversely affected, causing the circuitry to not operate properly or fail.

[0006] An apparatus and method of providing a heat sink to dissipate the heat sourced by the encapsulated transistors of a SOI chip, is therefore needed.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

Figure 1 is a cross section view of a MOS transistor on a SOI wafer having a heat sink according to one embodiment of the present invention.

Figure 2 is a cross section of a bipolar transistor on a SOI wafer having a heat sink according to another embodiment of the present invention.

Figure 3A-3F are a series of cross sections which illustrate the process to form a heat sink on a SOI wafer according to one embodiment of the present invention.

Figure 4 is a flow chart describing the semiconductor fabrication steps to form the heat sinks on an SOI wafer according to the present invention.

In the Figures, like reference numbers refer to like components and elements.

10. (original) The apparatus of claim 9, wherein the plug has a length substantially the same as the thickness of the bulk silicon layer.

11. (original) The apparatus of claim 9, wherein the plug has a circumference ranging from 1 to 50000 microns.

12. (previously presented) The apparatus of claim 1, further comprising

a plurality of transistors formed in the active region, and

a plurality of heat sinks associated with the plurality of transistors respectively, each of the plurality of heat sinks formed in the bulk silicon layer configured to sink heat sourced in the oxide layer to the second surface of the bulk silicon layer, each of the heat sinks being plugged shaped and filled with the thermally conductive paste.

13. (original) The apparatus of claim 12, wherein the plurality of transistors and the plurality of heat sinks are formed on ~~a semi~~conductor die.

14. (original) The apparatus of claim 12, wherein the plurality of transistors and the plurality of heat sinks are formed on a semiconductor wafer.

15. (original) The apparatus of claim 1, wherein the bulk silicon layer is formed in a semiconductor material having one of the following orientations: 100, 111, or 110.

16. (original) The apparatus of claim 1, wherein the active silicon layer is formed in a semiconductor material having one of the following orientations: 100, 111, or 110.

17. -25. (cancelled)

26. (previously presented) The apparatus of claim 1, wherein the thermally conductive paste is DAG.

PTO/SB/44 (10-96)
Approved for use through 6/30/99. OMB 0651-0033
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PT-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,119,431 B1 Page 1 of 1

DATED : October 10, 2006

INVENTOR(S) : Hopper et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Specification:

Column 1, line 42, change "stricture" to --structure--.

Column 2, line 30, change "to fom" to --to form--.

In the Claims:

In line 1 of claim 9 (column 6, line 30) change "claim 7" to --to claim 8--.

MAILING ADDRESS OF SENDER:

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